

## APPENDIX C

### Timber Harvest Scheduling



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# TIMBER HARVEST SCHEDULING

### REGULATION AND CONTROL

Regulation is the organization and control of the Forest's growing stock to achieve a sustained yield of forest products. Regulation is accomplished by controlling the growth and removal of the growing stock over time. A forest in a completely regulated condition would provide a sustained yield harvest equal to the volume growth in any period.

A regulated forest should be regarded as an objective that may never be fully attained. Perfect regulation could only be achieved if climate and weather patterns affecting growth were unchanging and completely predictable, natural disasters could be prevented, the productive land base were constant, and numerous other factors were held constant. However, the concept of regulation as an objective, is used to control present harvest levels and plan future harvests to assure sustained yield within reasonable limits.

A forest consisting of wild and managed stands with highly variable stocking levels and age class distribution is made to approach regulation through harvest and scheduling regeneration over a period of time called the conversion period. During the conversion period an attempt is made to meet three criteria:

1. Obtain the maximum yield of timber possible, while also maximizing the present net value of timber costs and returns.
2. Provide for non-declining and essentially non-fluctuating yields over the conversion period.
3. Provide a balance of age classes and stocking levels capable of producing the forest's full potential timber growth at the end of the conversion period.

Two methods of control are generally employed during the conversion period:

1. *Area Control* - This method is generally associated with even-aged management. It provides for harvesting and regenerating areas of equal productivity. The expected result at the end of the conversion period would be a balanced distribution of age classes. Strict application of *area control* does not account for the stocking and age class imbalance present in the unregulated forest and will not produce equal yields during the conversion period.
2. *Volume Control* - This method can be applied to even or uneven-aged management schemes. It provides for yields over the conversion period based on present and expected volumes of trees or stands. Strict volume control does not adequately address age class distribution and may not lead to a regulated forest.

The intensive management of the presently unregulated forest requires a method that provides a large degree of control of both area and volume to achieve both conversion period and post conversion period yield objectives. Such an area volume control method is used for planning in all areas to be managed under the even-aged system. Volume control is planned for areas to be managed under the uneven-aged system.

## Area Control

The FORPLAN linear programming model has established a harvest acreage schedule as a guide to achieving the long-term desired age class distribution. The harvest acreage schedule is shown in Table C-1.

TABLE C-1  
Tentative Priorities for Harvest During the First Decade

TYPE OF HARVEST	STRATUM	AVERAGE ANNUAL	TOTAL ACRES
Green Tree Retention and Shelterwood	M2G	15	152
	M3P	167	1,671
	M4P	108	1,085
	M4S	127	1,269
	M6G	28	275
	C4X	131	1,308
	RXX	40	402
Selection	All	N/A	4,819

Harvests under the uneven-aged system will take place in geologically sensitive areas, retention visual quality objective areas, and in or adjacent to recreation areas. Total acres to be managed under the uneven-aged system are shown in Table C-1 and do not necessarily represent the total acres to be actually cut during the planning period. These acreages are associated with an average yield per acre for all of the strata included in uneven-aged management areas. Stands making up each stratum are not uniform in stocking and fewer acres than indicated will be treated during the plan period. Acreage figures in this case are best regarded as the amount of land to be examined for harvest in project planning.

## Volume Control

### Allowable Sale Quantity

The allowable sale quantity for this Plan is defined as the maximum quantity of timber that may be scheduled from suitable lands for the next 10-15 years. The allowable sale quantity is constrained by harvest control required to meet long-term sustained yield and regulation requirements and multiple-use and environmental considerations. It is an expression of the biological potential of the regulated forest to produce timber within the constraints of other resource needs. The allowable sale quantity is shown in Table C-2.

Prescriptions for each working group, stratum, and land class together with their associated acreages were combined with the yield data developed as part of the Forest inventory to determine harvest schedules and the allowable sale quantity. Numerous FORPLAN computer runs were made with varying constraint levels, sustained yield fluctuations, timber stand availability for harvest, and objectives to be optimized. The result of the FORPLAN modeling process was a final harvest schedule under which the annual allowable sale quantity is 1.84 MMCF (12.2 MMBF) in the first decade. Figure C-1 diagrams the allowable sale quantity and the long-term sustained yield capacity for the 16 decade planning horizon.

## Additional Sales

Portions of the Forest will not be organized for regular periodic timber production. Yields from unsuitable lands, non-productive lands, administrative sites and developed recreation sites, are included in this category. In addition, yields from convertible products such as fuelwood, posts and poles, and noncommercial species are also included in the additional harvest volumes. Low productivity and variable markets preclude regulation or sustained yield of these timber stands or products at this time. An average periodic volume has been assigned based primarily on the current firewood and salvage programs. Additional sales volume is shown in Table C-2.

## Annual Programed Sale Quantity

The annual programed sale quantity is that portion of the allowable sale quantity, plus additional sales, that is scheduled for a specific year. It is determined on the basis of silvicultural direction, current demand, funding and multiple use direction. The allowable sale quantity component of the annual programmed sale quantity offered in any given year may exceed, or be less than, the average annual allowable sale quantity. However, the total volume offered for the decade cannot exceed the total decade allowable sale quantity by more than the limits shown in the monitoring plan.

Allowable sale quantity harvest volumes are not generally interchangeable. In particular, yields from non-key watersheds (7.7 MMBF/yr, first decade) are not interchangeable with yields from key watersheds (4.5 MMBF/yr, first decade); the reverse is also true. Yields from the even-aged system cannot be used to offset yields planned from the uneven-aged system, because all yields planned from the uneven-aged system occur within Regulation Class III. Yields from the green tree retention and the shelterwood methods are interchangeable since both of these methods are used to regenerate new stands under the even-aged system.

Sanitation and salvage volumes from suitable lands are an integral part of the yields anticipated by the Plan. They are included as part of the yields predicted by the yield tables for each stratum, and as such, they are considered part of the scheduled Allowable Sale Quantity. For ease in using this Plan, it is necessary to document only that sanitation or salvage volumes come from suitable lands when they occur. In this way total yield during the decade including sanitation and salvage volume need only be compared to the Allowable Sale Quantity to determine if volume regulation was attained.

## Adjustment Period

Timber harvests resulting from timber sales already sold but not harvested will not be affected by the adoption of this plan. Harvests from timber sales to be sold in FY 94 will also not be affected by the Plan since a major commitment of resources and effort has gone into the preparation of these sales. Therefore, the Forest will have to rely on the period between FY 95 and 98 to bring actual sale proposals into conformance with the harvest schedule in this Plan.

TABLE C-2

**ALLOWABLE SALE QUANTITY AND TIMBER SALE PROGRAM QUANTITY  
(ANNUAL AVERAGE FOR FIRST DECADE)**

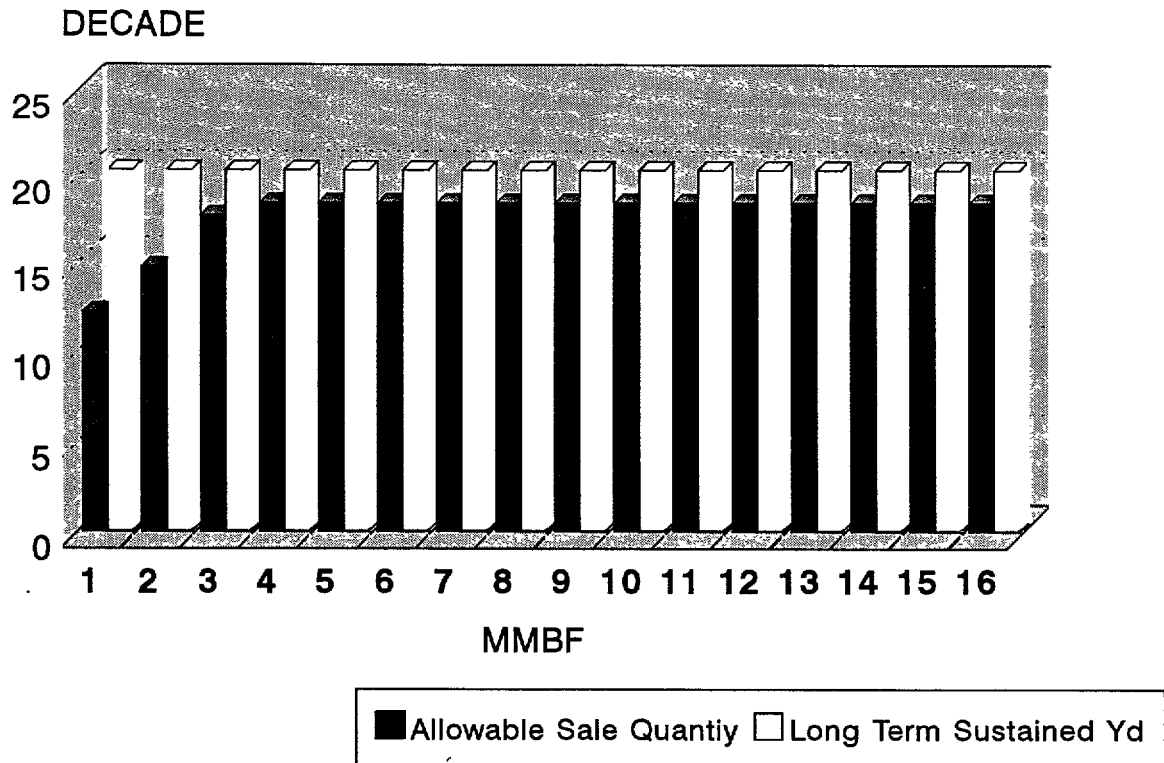
HARVEST METHOD	MMBF	MMCF
●Regeneration Harvest 1/ Green Tree Retention and Shelterwood	10.6	1.58
●Selection 1/	1.6	0.26
●Salvage/Sanitation 1/	0.2	0.03
●Miscellaneous 2/	3.8	0.50
<b>TOTAL PROGRAMMED SALE QUANTITY</b>	<b>16.2</b>	<b>2.37</b>

1/ Includes only chargeable volumes from suitable lands.

2/ Includes only nonchargeable volumes from unsuitable lands.

FIGURE C-1

ASQ vs LTSY



## **TIMBER SALE PROGRAM**

### Timberland Classification

Section 219.12b of the NFMA Planning Regulations states that "each Forest Plan will identify lands available capable and suitable for timber production and harvesting during the planning process." Table C-3 shows the timberland classification developed to meet this requirement for the Mendocino National Forest. The following is an explanation of how each of the land categories in the table was identified:

1. Non-Forest land: Non-forest land was identified from timber stand classification maps produced for the Forest planning process in 1980. Non-forest land includes brush, grass, and barren areas.
2. Forest land: Forest land was also identified from the 1980 timber stand classification maps. Ten percent tree cover was required for land to be classified as forested on the stand maps. Forested land timber types from the timber stand classification maps include mixed conifer, ponderosa/Jeffrey pine, sugar pine, knobcone pine, incense cedar, Douglas-fir, white fir, and red fir. Black oak, mixed hardwoods, and hardwood savannah types are also included in the forested land classification. These types correspond to the following vegetative types in the Land Management Planning database: mixed conifer, red fir, conifer-hardwood, hardwood, hardwood savannah, and knobcone pine.
3. Forest land withdrawn from timber production: Includes forested land withdrawn from timber production by statute or by the Secretary of Agriculture or Chief. Included are the Yolla-Bolly and Snow Mountain Wilderness Areas, the Middle Fork of the Eel River Wild River corridor, and the Late Successional Reserves (LSRs).
4. Forest land not capable of producing crops of industrial wood: Includes forest land not capable of producing 20 cubic feet per acre per year of industrial forest products. The knobcone pine, black oak, mixed hardwoods, and hardwood savannah types from the timber stand classification maps were placed in this category. In terms of Land Management Planning vegetative types, the hardwood, hardwood savannah, and knobcone pine forest types, and portions of the conifer-hardwood type were placed in this category.
5. Forest land physically unsuitable: Includes lands where irreversible watershed damage is likely to occur and lands not restockable within 5 years. Irreversible watershed damage will occur where landslides are present in the inner gorge of the larger stream channels or drainages. These areas were first identified on aerial photographs, and then verified by Ranger District personnel based on prior knowledge of the area or by field checks. Lands not restockable within 5 years were identified initially from mapped information delineating soil characteristics, steepness of slope, slope aspect, current stocking of commercial conifer species, and the presence or absence of hardwoods species. Areas initially classified as not restockable within five years were verified by Ranger District personnel based on prior knowledge of the areas or by field checks.
6. Forest land - inadequate information: Adequate information was available to project responses to timber management for all remaining capable and available timberlands.
7. Tentatively suitable forest land: The tentatively suitable timberland base after withdrawn, not capable, and physically unsuitable forest land had been removed.
8. Forest land not appropriate for timber production: Includes riparian reserves, portions of the conifer-hardwood type (C4X) where long-span or helicopter logging would be required, and all of the smaller size class conifer-hardwood type (C2X).

9. Unsuitable forest land: As indicated in the table, all forest land withdrawn, not capable, physically unsuitable, and not appropriate for timber production.
10. Total suitable forest land: Total forested land less the unsuitable forest land.
11. Total National Forest land: The total area within the boundary of the Mendocino National Forest, not including private land.

TABLE C-3  
LAND CLASSIFICATION FOR TIMBER

CLASSIFICATION	M-ACRES
1. NON-FOREST LAND	255.6
2. FOREST LAND	638.8
3. FOREST LAND WITHDRAWN FROM TIMBER PRODUCTION	234.9
4. FOREST LAND INCAPABLE OF PRODUCING INDUSTRIAL WOOD	166.9
5. FOREST LAND PHYSICALLY UNSUITED	
...irreversible damage to soils or watersheds	15.7
...un-regenerable within 5 years	12.9
6. INADEQUATE DATA TO PROJECT RESPONSE	0
7. TENTATIVELY SUITABLE FOREST LAND (item 2 minus items 3,4,5, and 6)	208.4
8. NOT SUITABLE FOR TIMBER PRODUCTION	147.4
9. TOTAL UNSUITABLE ACRES (sum of items 3,4,5,6, and 8)	577.8
10. TOTAL SUITABLE ACRES (item 2 minus item 9)	61.0
11. TOTAL NATIONAL FOREST ACRES (sum of items 1 & 2)	894.4

#### Ten Year Sale Program

A tentative program for the ten-year Plan period is presented in Table C-4. Information is presented by individual sales, watersheds, and by Planning Units.

The ten year timber sale program presented here is based on current conditions and information available at the time the Forest Plan was developed. If these conditions change, or if new information becomes available, the program may be modified during the implementation of the Plan.

TABLE C-4  
10-YEAR TIMBER SALE ACTION PLAN

SALE NAME AND YEAR OF SELL	PLANNING UNIT*	MMBF	SALE NAME AND YEAR OF SELL	PLANNING UNIT*	MMBF
<b>FY-95</b>			<b>FY-2000</b>		
Peavine . . . . .	Eastside . . . . .	2.8	Briscoe WS . . . . .	Eastside . . . . .	3.0
Johnson Cabin . . .	Eastside . . . . .	1.2	Black Butte WS . . .	Eastside . . . . .	2.5
Saddle . . . . .	Westside . . . . .	0.3	Salt-Heifer WS . . .	Eastside . . . . .	1.5
Smoke . . . . .	Westside . . . . .	0.6	Main Eel WS . . . .	Westside . . . . .	4.0
Small Sales . . . .	All . . . . .	2.0	Small Sales . . . . .	All . . . . .	1.5
Total . . . . .		6.9	Total . . . . .		12.5
<b>FY-96</b>			<b>FY-2001</b>		
Five & Dime . . . .	Eastside . . . . .	2.0	Grindstone WS . . .	Eastside . . . . .	2.0
Kop . . . . .	Eastside . . . . .	2.0	Black Butte WS . . .	Eastside . . . . .	4.0
Gibson . . . . .	Eastside . . . . .	2.0	Black Butte WS . . .	Westside . . . . .	3.0
Small Sales . . . .	All . . . . .	2.0	N. Fork Cache . . .	Westside . . . . .	2.0
Total . . . . .		8.0	Small Sales . . . . .	All . . . . .	1.2
			Total . . . . .		12.5
<b>FY-97</b>			<b>FY-2002</b>		
Flat . . . . .	Eastside . . . . .	4.0	Thomes Creek WS .	Eastside . . . . .	5.0
Salt Log . . . . .	Eastside . . . . .	1.0	Black Butte WS . . .	Eastside . . . . .	3.0
Telephone Pole . .	Eastside . . . . .	2.0	Middle Eel WS . . .	Westside . . . . .	3.0
Ruppert . . . . .	Westside . . . . .	0.8	Small Sales . . . . .	All . . . . .	1.5
Hi Copter . . . . .	Westside . . . . .	1.5	Total . . . . .		12.5
Fly Cull . . . . .	Westside . . . . .	0.5			
Blands . . . . .	Westside . . . . .	2.0			
Small Sales . . . .	All . . . . .	1.5			
Total . . . . .		13.3			
<b>FY-98</b>			<b>FY-2003</b>		
Town . . . . .	Eastside . . . . .	2.0	Grindstone WS . . .	Eastside . . . . .	5.0
Rocky-Top . . . . .	Eastside . . . . .	2.5	Black Butte WS . . .	Eastside . . . . .	2.0
Divide Auger . . . .	Eastside . . . . .	1.5	N. Fork Cache . . .	Westside . . . . .	2.0
Logan-Cherry . . . .	Westside . . . . .	4.0	Middle Eel WS . . .	Westside . . . . .	2.0
Steel Bench . . . .	Westside . . . . .	2.0	Small Sales . . . . .	All . . . . .	1.5
Small Sales . . . .	All . . . . .	1.5	Total . . . . .		12.5
Total . . . . .		13.5			
<b>FY-99</b>			<b>FY-2004</b>		
Gulch . . . . .	Eastside . . . . .	2.5	Thomes Creek WS .	Eastside . . . . .	5.0
Ice . . . . .	Eastside . . . . .	2.5	Little Stony WS . . .	Eastside . . . . .	3.0
Powell . . . . .	Eastside . . . . .	1.5	Elk Creek WS . . . .	Westside . . . . .	1.5
Panhandle . . . . .	Eastside . . . . .	3.0	Upper Lake WS . . .	Westside . . . . .	1.5
Middle Eel WS . . .	Westside . . . . .	1.5	Small Sales . . . . .	All . . . . .	1.5
Small Sales . . . .	All . . . . .	1.5	Total . . . . .		12.5
Total . . . . .		12.5			

\* Eastside Planning Unit: Corning and Stonyford Ranger Districts; Westside Planning Unit: Upper Lake and Covelo Ranger Districts.

WS = Watershed



Tables C-5, C-6, and C-7 display acreages by management practice, timber productivity classification, and the present and expected forest conditions.

TABLE C-5

VEGETATION MANAGEMENT PRACTICES  
(ANNUAL AVERAGE IN FIRST DECADE FOR SUITABLE LANDS)

PRACTICE	ACRES
Green Tree Retention . . . . .	581
Shelterwood/Seedcut . . . . .	349
Total Even-Aged Management . . . . .	930
Uneven-Aged Management (Selection) . . . . .	4,819
Timber Stand Improvement . . . . .	2,000
Reforestation . . . . .	581

TABLE C-6

TIMBER PRODUCTIVITY CLASSIFICATION

Potential Growth (ft <sup>3</sup> /ac/yr)	Suitable Lands (acres)	Unsuitable Lands (acres)
Less Than 20	0	0
20-49	3,607	19,359
50-84	0	60,836
85-119	35,200	198,142
120-164	22,193	132,577
165-224	0	0
225+	0	0

TABLE C-7

## PRESENT AND FUTURE FOREST CONDITIONS

## Present Forest:

	Unit of Measure	Suitable Land	Unsuitable Land
Growing Stock	MMCF	179.6	1,286.4
	MMBF	1,178.8	8,643.6
Live Cull	MMCF	0.8	5.6
	MMBF	5.4	38.0
Salvable Dead	MMCF	2.0	14.7
	MMBF	13.7	98.6
Annual Net Growth	MMCF	2.1	18.0
	MMBF	13.9	120.8
Annual Mortality	MMCF	4.2	29.8
	MMBF	28.1	199.5

## Future Forest (160 years):

	Unit of Measure	Suitable Land
Growing Stock	MMCF	193.3
Annual Net Growth	MMCF	2.5
Rotation Age	YEARS	60-240